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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,527	08/24/2006	Marcus Brian Mayhall Fenton	C049105/0225758	9772

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BRYAN CAVE LLP
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EXAMINER

CERNOCH, STEVEN MICHAEL

ART UNIT	PAPER NUMBER
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3752

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07/13/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/590,527	Applicant(s) FENTON ET AL.	
	Examiner STEVEN M. CERNOCH	Art Unit 3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 and 41-60 is/are pending in the application.
- 4a) Of the above claim(s) 7,13,16-18,23-27,29-34,45,48 and 53-55 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-12,14,15,19-22,28,35-39,41-44,46,47,49-52 and 56-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/7/2011 has been entered.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-6, 8-12, 14, 15, 19-22, 28, 35-44, 46, 47, 49-52 and 56-60 are provisionally rejected on the ground of nonstatutory double patenting over claims 52-89

Art Unit: 3752

of copending Application No. 10/590,456. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: An apparatus for generating a mist comprising: a housing having a plurality of interior walls, at least one of the plurality of interior walls defining a passageway along a longitudinal center axis, the passageway having an inlet, a plenum adjacent to the inlet, and a portion adjacent to the plenum, and an outlet, the at least one of the plurality of interior walls being tapered outwardly with respect to the axis along the portion; a protrusion with a solid interior located proximate the portion, the protrusion having an outer surface tapered outwardly with respect to the axis; a transport nozzle defined between: the at least one of the plurality of interior walls tapered outwardly with respect to the axis along the portion, and the outer surface tapered outwardly of the protrusion; a working nozzle being defined by other of the plurality of interior walls of the housing, the working nozzle being coincident the transport nozzle so that a working fluid communicated to the working nozzle mixes with a transport fluid exiting the transport nozzle; and a working fluid inlet disposed along the housing in communication with the working nozzle; wherein the working nozzle is defined by a working nozzle outer surface facing inward toward the axis and a working nozzle inner surface facing outward away from the axis;

Art Unit: 3752

wherein at least part of the working nozzle outer surface converges toward the axis in a direction along the axis toward the outlet.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 9-12, 14, 15, 19-22, 28 and 35-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Holmes (US Pat No 5,484,107).

Re claim 1, Holmes shows an apparatus (Fig. 1) for generating a mist comprising: a conduit (10) having a mixing chamber (24/32) and an exit (34); and a means for creating a dispersed droplet flow regime in which a substantial portion of the droplets have a size of less than 20 micrometers (the apparatus of Holmes as shown teaches all of the structural attributes claimed and is therefore capable of operating in the same manner as the claimed invention), said means comprising: a working fluid inlet (20) in fluid communication with said conduit to introduce a working fluid into the conduit; and a transport nozzle (28) in fluid communication with the conduit to introduce a transport fluid into the mixing chamber; wherein the transport nozzle includes a

Art Unit: 3752

convergent-divergent portion therein to provide for the generation of high velocity flow of the transport fluid; and wherein the transport nozzle (28) and conduit (24/32) have a relative angular orientation at the mixing chamber by for the introduction of transport fluid flow from the transport nozzle into working fluid flow from the conduit and for shearing of the working fluid by the transport fluid.

Re claim 9, Holmes shows the transport nozzle (Fig. 1, 28) is oriented at an angle beta of between 0 to 30 degrees.

Re claim 10, Holmes shows the transport nozzle (Fig. 1, 28) is annular and has a divergent flow pattern at the mixing chamber (24/32).

Re claim 11, Holmes shows the transport nozzle (Fig. 1, 28) has inner and outer surfaces each being substantially frustoconical in shape.

Re claim 12, Holmes shows a working nozzle (Fig. 1, 22) in fluid communication with the conduit (24/32) for the introduction of working fluid into the mixing chamber).

Re claim 14, Holmes shows the working nozzle (Fig. 1, 22) is annular at the mixing chamber (24/32).

Re claim 15, Holmes shows the working nozzle (Fig. 1, 22) has inner and outer surfaces each being substantially frustoconical in shape.

Re claim 19, Holmes shows the conduit (Fig. 1, 10) includes a passage (24/32).

Re claim 20, Holmes shows the inner wall of the passage (24/32) comprises a contoured portion comprising a means to induce turbulence (col. 2, lines 5-13) of the working fluid upstream of the transport nozzle (28).

Re claim 21, Holmes shows the mixing chamber (Fig. 1, 32) includes an inlet (24) for the introduction of an inlet fluid.

Re claim 22, Holmes shows the mixing chamber (Fig. 1, 24/32) is closed upstream of the transport nozzle (28) just as much as applicants elected species shows the mixing chamber is closed upstream of the transport nozzle.

Re claim 28, Holmes shows control means to control one or more of the flow rate, pressure, velocity, quality and temperature of the inlet and/or working and/or transport fluids (col. 2, lines 5-13).

Re claim 35, Holmes shows a spray system (Fig. 1) comprising the apparatus of claim 1 and transport fluid in the form of steam (col. 2, line 7).

Re claim 36, Holmes shows including working fluid in the form of water (col. 3, lines 12-13).

Re claim 37, Holmes shows steam (col. 2, line 7) and water (col. 3, lines 12-13) and therefore inherently teaches a steam generator and a water supply.

Re claim 38, Holmes shows the spray system is portable (Fig. 1).

Claim Rejections - 35 USC § 103

Claims 3, 5 & 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes (US Pat No 5,484,107).

Re claim 3, Holmes shows a cumulative distribution of the droplets but does not teach that the distribution is greater than 90%. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a distribution greater than 90%, since it has been held that where the general conditions of a claim

Art Unit: 3752

are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

It would be obvious to one of ordinary skill in the art to have a cumulative distribution greater than 90% so that almost the entirety of if not the entirety of a coating surface is covered with a coating.

Re claim 5, Holmes shows an annular working nozzle (Fig. 1, 22) and the transport nozzle (28) but does not teach that the working nozzle circumscribes the transport nozzle. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the working nozzle circumscribe the transport nozzle, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art.

It would have been obvious to one of ordinary skill in the art to reverse the working and transport nozzles of Holmes to affect the spray pattern.

Re claim 8, Holmes shows the transport nozzle (Fig. 1, 28) has an exit area to throat ratio and an alpha angle; Holmes does not teach the ratio being in the range 1.75 to 15 or the alpha angle substantially equal to or less than 6 degrees. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the exit area to throat ratio in the range of 1.75 to 15 and the alpha angle substantially equal to or less than 6 degrees, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Art Unit: 3752

It would have been obvious to one of ordinary skill in the art to have an exit area to throat ratio of 1.75 to 15 and the alpha angle substantially equal to or less than 6 degrees to affect spray pattern.

Claims 1, 2, 39, 41-43, 47, 49-51, 56 & 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes (US Pat No 5,484,107) in view of Ruta et al. (US Pat No 6,012,647).

Re claims 1 & 39, Holmes shows a method of generating a mist comprising the steps of: introducing a flow of transport fluid (Fig. 1, fluid 3) into a mixing chamber (24/32) through an annular transport nozzle (28); introducing a working fluid (20) into the mixing chamber through an annular working nozzle (22); generating a high velocity flow of the transport fluid by way of a convergent-divergent portion within the transport nozzle; orienting the transport nozzle and the working nozzle such that the high velocity transport fluid flow imparts a shearing force on the working fluid flow (col. 2, lines 5-13); and atomizing the working fluid and creating a dispersed droplet flow regime of droplets under the shearing action of the working fluid on the transport fluid in which a substantial portion of the droplets have a size.

Holmes does not teach in which a substantial portion of the droplets have a size less than 20 micrometers.

However, Ruta et al. does teach atomizing a fluid so that a substantial portion of the droplets have a size less than 20 micrometers (col. 5, lines 12-15).

Therefore it would have been obvious to one of ordinary skill in the art to modify the size of the droplets produced by Holmes to be in the range taught by Ruta et al. for a more uniform size and number density of the droplets (col. 1, lines 50-51).

Re claim 41, Holmes as modified by Ruta shows the stream of transport fluid (Holmes - Fig. 1, 28) introduced in the mixing chamber (Holmes - 24/32) is annular.

Re claim 42, Holmes as modified by Ruta shows the apparatus has an axis and the working nozzle (Holmes – Fig. 1, 22) is defined by a working nozzle outer surface facing inward toward the axis and a working nozzle inner surface facing outward away from the axis; wherein at least part of the working nozzle outer surface converges toward the axis in a direction along the axis toward the mixing chamber (Holmes – 24/32).

Re claim 43, Holmes shows an annular working nozzle (Holmes - Fig. 1, 22) and the transport nozzle (Holmes - 28) but does not teach that the working nozzle circumscribes the transport nozzle. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the working nozzle circumscribe the transport nozzle, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art.

It would have been obvious to one of ordinary skill in the art to reverse the working and transport nozzles of Holmes to affect the spray pattern.

Re claim 44, Holmes as modified by Ruta shows an inlet fluid is introduced into the mixing chamber (Holmes - Fig. 1, 24/32) via an inlet (Holmes - 14) of the mixing chamber of the apparatus.

Art Unit: 3752

Re claim 47, Holmes as modified by Ruta shows introducing the transport fluid in the mixing chamber as a sub-sonic flow (Holmes - col. 2, lines 10-11).

Re claim 49, Holmes as modified by Ruta shows the mist is controlled by modulating at least one of the following parameters: the flow rate, pressure, velocity, quality and/or temperature of the transport fluid; the flow rate, pressure, velocity, quality and/or temperature of the working fluid; the flow rate, pressure, velocity, quality and/or temperature of the inlet fluid; the angular orientation of the transport and/or working and/or secondary nozzle(s) of the apparatus; the internal geometry of the transport and/or working and/or secondary nozzle(s) of the apparatus; and the internal geometry, length and/or cross section of the mixing chamber (Holmes - col. 2, lines 5-13).

Re claims 2 & 50, Holmes as modified by Ruta shows having a substantial proportion of its droplets having a size less than 20 micrometers (Ruta - col. 5, lines 12-15).

Re claims 4 & 51, Holmes as modified by Ruta shows having a substantial proportion of its droplets having a size less than 10 micrometers (Ruta - col. 5, lines 24-25).

Re claim 56, Holmes as modified by Ruta shows the transport fluid is steam (Holmes - col. 2, line 7) of an air/steam mixture.

Re claim 57, Holmes as modified by Ruta shows the working fluid is water (Holmes – col. 3, lines 12-13) or a water-based liquid.

Art Unit: 3752

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes (US Pat No 5,484,107) as applied to claims 1, 3, 5, 8-12, 14, 15, 19-22, 28 and 35-38 above, and further in view of Base et al. (US Pat No 6,003,789).

Re claim 6, Holmes does not teach the mixing chamber includes a converging portion.

However, Base et al. does teach a mixing chamber (Fig. 2, 10) including a converging portion.

Therefore it would have been obvious to have the mixing chamber of Holmes including a converging portion as taught by Base et al. to accelerate the flow (abstract).

Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes (US Pat No 5,484,107) in view of Ruta et al. (US Pat No 6,012,647) as applied to claims 1, 2, 39, 41-43, 47, 49-51, 56 & 57 above, and further in view of Base et al. (US Pat No 6,003,789).

Re claim 46, Holmes as modified by Ruta teaches introducing the transport fluid into the mixing chamber but does not teach introducing the fluid as a supersonic flow.

However, Base et al. teaches introducing the fluid into the mixing chamber as a supersonic flow (abstract).

Therefore it would have been obvious to introduce the transport fluid of Holmes as modified by Ruta et al. as a supersonic flow as taught by Base et al. to reduce the droplet size (abstract).

Claims 52 & 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes (US Pat No 5,484,107) in view of Ruta et al. (US Pat No 6,012,647) as applied

Art Unit: 3752

to claims 1, 2, 39, 41-43, 47, 49-51, 56 & 57 above, and further in view of Rummel (US Pat No 7,040,551 B2).

Re claim 52, Holmes as modified by Ruta does not teach generation of condensation shocks and/or momentum transfer to provide suction within the apparatus.

However, Rummel does teach generation of condensation shocks and/or momentum transfer to provide suction within the apparatus (col. 4, lines 7-19).

Therefore it would have been obvious to have the apparatus of Holmes as modified by Ruta et al. provided suction as taught by Rummel to clean the apparatus (col. 4, lines 7-19).

Re claim 58, Holmes as modified by Ruta does not specify that the mist is used for fire suppression.

However, Rummel does specify the mist is used for fire suppression (col. 7, line 8).

Therefore it would have been obvious to utilize the mist of Holmes as modified by Ruta for fire extinguishing as taught by Rummel for safety.

Claims 59 & 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes (US Pat No 5,484,107) in view of Ruta et al. (US Pat No 6,012,647) as applied to claims 1, 2, 39, 41-43, 47, 49-51, 56 & 57 above, and further in view of Letvin (US Pat No 3,385,030).

Re claims 59 & 60, Holmes as modified by Ruta does not teach using the mist for decontamination or gas scrubbing.

Art Unit: 3752

However, Letvin does teach using a mist for decontamination (col. 4, lines 3-4) and gas scrubbing (col. 1, lines 31-34).

Therefore it would have been obvious to utilize the mist of Holmes as modified by Ruta for decontamination and gas scrubbing as taught by Letvin for the purposes of cleaning industrial type gases before discharging them into the atmosphere (col. 1, lines 35-36).

Response to Arguments

Applicant's arguments with respect to claims 1-60 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fenton, Kraus, Probst, Nagata, Loth, Adiga, Burns, Steinthorsson, Gjerde and Friedell all show aspects of the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEVEN M. CERNOCH whose telephone number is (571)270-3540. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571)272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3752

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. M. C./

Examiner, Art Unit 3752

7/5/2011

/Len Tran/

Supervisory Patent Examiner, Art Unit 3752